SKO-104-A-1

808-101 A

08/627270

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Docket No. SKO-104-A-1

Anticipated Classification
of this Application:

Class 118

Prior Application:

Examiner: J. Bell
Art Unit: 1112

Box Patent Applications
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

This is a request for filing a divisional application under 37 CFR 1.60, of pending prior application Serial Number 08/398,881 filed on March 6, 1995 of Hideaki TOJO, Hideo ISHIDA, Hisashi KUROTA, Hideo HIROE, Takao ARASAWA, Satoru YAMADA and Nobuyuki OKITA for "METHOD AND MACHINE FOR FORMING PROTECTIVE FILM ON SPRAYED COATING OF LARGE-SIZED PRODUCT."

A copy of the specification, claims, abstract, Declaration, Assignment and drawings filed in the prior application is enclosed herewith. Also enclosed is a verified statement by applicant's undersigned attorney attesting to the fact that the application papers comprise a true copy of the prior application as filed, and copies of Information Disclosure Statements filed in the prior application. A Preliminary Amendment-A and a Petition under Rule 37

CFR §1.48(b)(i) are also being filed concurrently herewith.

The filing fee is calculated below:

Claims as filed in the prior application, less any claims cancelled by the Preliminary Amendment-A:

Basic Fee:	$750.00
Total Claims: 20 - 20 = 0 x $22.00	-0-
Independent Claims: 4 - 3 = 0 x $78.00	78.00
TOTAL FILING FEE:	$828.00

A check in the amount of $828.00 is enclosed. The Commissioner is hereby authorized to charge any deficiency which may be required during the entire pendency of the application, or to credit any excess paid during the entire pendency of the application, to Deposit Account 23-0801. A duplicate copy of this sheet is enclosed.

Please amend the specification by inserting before the first line the sentence: --This is a divisional of Application Serial Number 08/398,881 filed March 6, 1995.--.

The prior application is assigned of record to HONDA GIKEN KOGYO KABUSHIKI KAISHA, the Assignment having been recorded at Reel 7387, Frames 103, 104, 105.

The Power of Attorney in the prior application is to Irving M. Weiner, Reg. No. 22,168; Joseph P. Carrier, Reg. No. 31,748; and Pamela S. Burt, Reg. No. 27,861 and William F. Esser, Reg. No. 38,053.

The Power appears in the original papers in the prior application (copy of Declaration enclosed).

Please address all future communications to:

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Maxim Building
42400 Grand River Avenue, Suite 207
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(810) 344-4422 MI

Please direct all telephone calls to Joseph P. Carrier, Reg. No. 31,748 at (810) 344-4422.

The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Respectfully submitted,

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April 3, 1996
Enclosures
JPC/jg

I hereby certify that this correspondence is being deposited with the U. S. Postal Service as Express Mail Certificate No. TB 710575415 US in an envelope addressed to Box Patent Applications, Commissioner of Patents and Trademarks, Washington, D.C. 20231 on April 4, 1996.

Dated: April 4, 1996

Jody Greene

08/627270 #24 1/5/96 pwl

SKO-104-A-1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Tojo et al.
Serial Number:	Unknown
Filed:	Concurrently herewith
Group Art Unit:	Unknown
Examiner:	Unknown
Title:	Method And Machine For Forming Protective Film On Sprayed Coating Of Large-Sized Product

PRELIMINARY AMENDMENT-A

Box Patent Application
Commissioner Of Patents And Trademarks
Washington, D.C. 20231

Sir:

In connection with the above-identified divisional application (filed concurrently herewith), please amend the application as follows.

IN THE SPECIFICATION:

Page 1 line 10, after "portions" insert --of the product--;

line 13, change "Where an" to --Typically after an automobile is--; delete "automobile is shipped"; change "once" to --initially--;

line 14, change ". Then, the automobile" to --before it--;

line 16, before the period insert "on the outside of the automobile";

line 21, before the period insert "to the automobile's surface, which would be removed when the automobile reached its shipping destination";

line 23, change "on" to --by--; change "work" to --operation--.

Page 2 line 9, change "prior art" to --known--.

Page 3 line 16, change "is" (second occurrence only) to --has been--.

Page 4 line 1, change "is openable" to --may be opened--;

line 11, change "winkers" to --turning lights--;

line 13, change "work" to --procedure--;

line 14, change "at" to --once the automobile reaches--;

line 15, change "work needs" to – –procedure involves– –;

line 18, before the period insert – –of the related art– –;

line 24, change "soil" to – –dirt– –.

Page 5 line 3, change "air blowing which utilizes" to – –blown– –;

line 5, change "contaminations" to – –contamination– –;

line 9, change "is" to – –will be– –;

line 11, change "for" to – –of– –;

line 14, change "consists" to – –comprises steps– –;

line 24, change "a" to – –the– –.

Page 6 line 1, change "machine" to – –apparatus– –; delete "out";

line 4, change "machine" to – –apparatus– –;

line 12, change "against" to – –on– –;

line 14, delete "either";

line 15, change "or" to – –and/or– –;

line 17, after "seals" insert a comma;

line 18, change "and" to – –and/or– –;

line 19, change "components" to – –parts with enhanced airtightness– –; change "against" to – –on– –;

line 21, change "and" to – –and/or– –;change "components" to – –parts with enhanced airtightness– –.

Page 7 line 2, change "against" to – –on– –;

line 5, change "winkers" to – –side lights– –;

line 6, change "for" to – –of– –; after "film" insert a comma;

line 7, change "if" to – –in conventional methods because– –;

line 8, after "components" insert a comma;

line 10, change "machine" to – –apparatus– –;

line 13, after "on" insert – –a combination of– –; change "method" to – –methods– –;

line 14, change "or" to – –and– –; change "embodiment" to

--embodiments--; change "present" to --combination--;

lines 15 and 16, delete "applying the strippable paint to the sprayed coating of the product,";

line 21, delete "preliminarily" (first occurrence).

Page 9 line 7, before "applying" insert --a washing step using warm water and a dehydrating step using hot air, an application step consisting of--;

line 8, after "subsequent" insert --drying--;

lines 8 and 9, change "applying the strippable paint" to --multiple drying stages--;

line 16, change "winkers" to --turning lights--;

line 23, after "formed" insert --, such--.

Page 10 line 10, after "to" insert --a preferred embodiment of--;

line 12, change "step" to --steps--;

line 13, delete "consisting"; before the period insert --and drying the strippable paint--;

line 14, change "illustrate" to --illustrated--.

Page 11 line 3, after "first" insert --preferred--; after "embodiment" insert --of the invention--;

line 4, change "is" to --once--; change "and" to --is--;

line 5, after "water," insert --and--;

line 11, after "water," insert --and--.

Page 12 line 10, after "automobile" insert --when--;

line 12, after "coating" insert --having--;

line 18, change "1.5 l/min" to --1.5 l/min--.

Page 13 line 3, change "certainly" to --reliably--;

line 5, after "second" insert --preferred--; after "invention" insert a comma;

line 7, after "product" insert a comma;

line 16, after "paint is" insert --preferably--;

line 20, after "be" insert --in ranges of--.

Page 14 line 2, change "out of" to --from--;

line 8, change "the" to --a--;

line 22, after "a" insert --preliminary drying--; delete "previous to the drying step 9";

line 23, after "as" insert --a heat source in--;

line 25, after "from" insert --the--; after "inside" insert --thereof--.

Page 15 line 3, change "started" to --initiated--;

line 4, before "surface" insert --outer--;

line 6, after "inside" insert --thereof--;

line 8, before "accelerated" insert --preferably--; before the period insert --according to the invention using an infrared drying furnace--;

line 13, after "is" insert --preferably--;

line 20, change "accessaries" to --accessories--;

line 21, change "accessaries" to --accessories--;

line 24, change "accessaries" to --accessories--;

line 25, change "or" to --and--.

Page 16 line 2, change "the application of" to --applying--;

line 3, change "the formation of" to --forming--; after the comma insert --and--;

line 4, after "preliminary" insert --and non-preliminary--; change "furnace" to --furnaces--;

lines 4 and 5, change ", and the non-preliminary drying furnace forms" to --form--;

line 10, change "certainly" to --reliably--;

line 11, before the period insert --according to the invention--; change "Especially" to --Particularly--;

line 14, delete "provided. The preliminary drying is".

Page 17 line 5, after "region" insert --, i.e., the hood surface,--;

line 8, before the semicolon insert --using pressure sensitive adhesive tape 15--;

line 20, after "circular" insert --piece of--;

line 24, change "Generally used" to --Conventional--.

Page 18 line 24, change "winker" to --turning light--.

Page 19 line 13, change "winker" to --turning light--;

line 15, change "winker" to --turning light--;

line 23, change "winker" to --turning light--;

line 25, before the period insert --embodiment--.

Page 20 line 6, change "work" to --procedure--;

line 12, change "pass" to --have been assembled and passed--;

line 13, delete "after being assembled";

lines 19 and 20, delete "after the automobile is assembled";

line 20, change "problem" to --problems--;

line 23, change "step" to --steps--;

line 25, after "cover" insert --relative to the vehicle body--.

Page 21 lines 2 and 3, change "Because consequently" to --Consequently, because--;

line 5, after "discontinuous" insert a comma; delete "and therefore";

line 6, after "necessary" insert --in the conventional method, so that--;

line 24, change "With this" to --According to the present--.

Page 22 line 4, before the period insert --, respectively--;

line 15, change "; before painting is carried out" to --involving--;

line 16, delete "ordinarily performed is";

line 17, change "and" to --after which--;

line 19, delete "this is";

line 20, after "automobile" insert --ordinarily--; delete "ordinarily

performed".

Page 23 line 2, change "conveying" to --conveyor--;

line 3, change "conveying" to --conveyor--;

line 11, after "painted" insert --body--; change "above-mentioned region" to --surface--;

line 16, after "step" insert --36--;

line 19, before the comma insert --embodiment--;

line 20, after "out" insert --immediately--.

Page 24 lines 5 and 6, change "described above" to --of Fig. 7--;

line 15, change "; before painting is carried out" to --involving--;

line 16, change "ordinarily performed is carried out on the automobile body, and" to --after which--;

line 19, after "automobile" insert --ordinarily--;

line 20, delete "ordinarily performed".

Page 25 line 2, change "coating, the strippable paint" to --is coated, it--;

line 3, change "or" to --and/or--.

Page 26 line 12, after the period add the following paragraph --Although there have been described what are at present considered to be the preferred embodiments of the invention, it will be understood that various modifications and variations may be made thereto without departing from the spirit and essence of the invention. The scope of the invention is indicated by the appended claims.--.

IN THE CLAIMS:

Please cancel claims 1-13, 17, 18, and 21 without prejudice, and without dedication or abandonment of the subject matter thereof.

Please amend the claims as follows.

Claim 14 line 1, change "A machine" to --Apparatus--;

line 2, after "coating" insert a comma;

lines 2 and 3, delete "such as an automobile";

line 4, change "machine" to --apparatus--;

line 5, delete "said".

19. (amended) [A machine] Apparatus for forming a protective film on a surface of a large-sized product finished with a sprayed coating [such as an automobile] by applying a strippable paint to a surface of said sprayed coating, said [machine] apparatus comprising:

a pretreatment [device] means including a washing device for washing away contaminations such as dust, dirty water, and rainwater from said surface of said coating of said product and a dehydrating device;

an application booth for applying [said] strippable paint to the product, said booth being located contiguous with said pretreatment [device] means;

a preliminary drying furnace for preliminarily drying the strippable paint applied to said product; and

a non-preliminary drying furnace for non-preliminarily drying said product already preliminarily dried.

20. (amended) A method for forming a protective film on a large paint-finished product [such as an automobile including a step of applying] using strippable paint, the method comprising [a step] the steps of: painting the large product so that the product is paint- finished;

assembling the paint-finished product by mounting an engine and functional parts thereto; and

coating strippable paint on a painted surface of the large paint-finished product [after a step of painting the large paint-finished product].

22. (amended) A method for forming a protective film on a large paint-finished product [such as an automobile] according to claim 20 [or claim 21], wherein [a] said assembling step [after the painting step is an assembly step of mounting an engine and functional parts and the like and a step after this assembly step is a] occurs prior to said strippable paint coating step.

23. (amended) A method for forming a protective film on a large paint-finished product [such as an automobile] according to claim 22, [wherein] further including a step of fitting an anti-scratch cover [fitting and removal steps are provided] to the paint-finished product before [and after] the assembly step, and removing said anti-scratch cover from the product after the assembly step.

24. (amended) A method for forming a protective film on a large paint-finished product [such as an automobile] according to claim 22, [wherein] further including a step of completed product inspection after the strippable paint coating step [following the assembly step is a completed product inspection step].

25. (Amended) A method for forming a protective film on a large paint-finished product [such as an automobile] according to claim 20 [or claim 21], wherein [a step after the painting step is a] said strippable paint coating step is after the painting step, and said [an assembly] assembling step [of mounting an engine and functional parts and the like] is disposed after the strippable paint coating step.

26. (amended) A method for forming a protective film on a ~~large~~ paint-finished ~~product~~ [such as an automobile] according to claim ~~25~~, [wherein] further including a step of finished product inspection following the assembly step [is a finished product inspection step].

Please add the following new claims.

27. (new) A method for forming a protective film on a large paint-finished product according to claim 20, further including the steps of:

preliminarily drying said coated strippable paint; and

non-preliminarily drying the preliminarily dried, strippable paint.

28. (new) A method for forming a protective film on a large paint-finished product according to claim 27, wherein said assembly step is prior to said strippable paint coating step.

29. (new) A method for forming a protective film on a large paint-finished product according to claim 27, further including an assembly step of mounting an engine and

functional parts to the paint-finished product after the strippable paint coating step.

30. (new) A method of claim 27, wherein said step of preliminarily drying said strippable paint uses infrared irradiation drying and said step of non-preliminarily drying said product uses hot air drying.

31. (new) The method of claim 27, further including the step of stabilizing the strippable paint after it is coated on said product and prior to said preliminary drying step.

32. (new) The method of claim 31, wherein said stabilizing step is performed at room temperature.

33. (new) The method of claim 27, wherein said preliminary and non-preliminary drying steps are performed at elevated temperatures.

34. (new) Apparatus for forming a protective film on a surface of a large-sized product finished with a sprayed coating by applying a strippable paint to a surface of the sprayed coating, the apparatus comprising:

pretreatment means for washing and dehydrating the surface of the sprayed coating;

means for applying strippable paint to said product;

means for preliminarily drying the strippable paint applied to said product; and

means for non-preliminarily drying said product after it has been preliminarily dried.

35. (new) Apparatus for forming a protective film on a large paint-finished product according to claim 34, further comprising an assembly booth for mounting an engine and functional parts to the paint-finished product prior to said strippable paint coating step.

36. (new) Apparatus for forming a protective film on a large paint-finished product according to claim 34, further including an assembly booth for mounting an engine and functional parts to the paint-finished product after the strippable paint coating step.

IN THE ABSTRACT:

Line 2, change "a machine" to --apparatus--;

line 5, after "is" insert --conventionally--;

line 6, change "and will be" to --for a period of time before it is--;

line 11, change "certainly" to --reliably--;

line 16, before the period insert --according to the invention--;

line 17, change "certainly" to - -reliably- -;

line 18, before the period insert - -, and the method and apparatus can be efficiently incorporated into an automobile assembly procedure- -.

A14

REMARKS:

The present Preliminary Amendment-A is being voluntarily submitted in order to eliminate informalities in the specification, claims and abstract, to eliminate multiple dependencies in the claims, to cancel claims 1-13, 17, 18, and 21 which are being pursued in prior application 08/398,881,and to add new claims 27-36. Applicant respectfully submits that the amendments are fully supported by the original disclosure.

A petition under Rule 37 CFR §1.47(b)(1) is being filed concurrently herewith.

Favorable consideration is respectfully requested.

Respectfully submitted,

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April 3, 1996

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I hereby certify that this correspondence is being deposited with the U.S. Postal Service as Express Mail Certificate TB710575415US in an envelope addressed to Box Patent Application, Commissioner of Patents and Trademarks, Washington, D.C. 20231 on April 4, 1996.

Dated: April 4, 1996
JPC/jg

Jody Greene

METHOD AND MACHINE FOR FORMING PROTECTIVE FILM ON SPRAYED COATING OF LARGE-SIZED PRODUCT

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a method of spraying a strippable liquid paint on the surface of a large-sized product finished with a sprayed coating, such as an automobile, to form a protective film. Also, the invention relates to a machine for implementing this method and to a method of forming this protective film in such a way that those portions of the product which need no protective film are not sprayed with the paint.

2. Description of the Related Art

Typically after an automobile is ~~Where an~~ assembled ~~automobile is shipped~~, it is initially ~~once~~ kept before it in stock. ~~Then, the automobile~~ is shipped. Therefore, a long interval passes until the vehicle is shipped. For this reason, dust or the like adheres to the surface of the sprayed coating. In order to prevent this adhesion of dust, it has been attempted to form a protective film on the surface of the sprayed coating of the automobile. In the past, this formation of the protective film has been carried out by applying a liquid, rust preventive wax.

In recent years, techniques for alleviating the burden imposed ~~on~~ by a wax-removing ~~work~~ operation performed at the destination or for environmental protection has been disclosed, for example in

Japanese Patent Laid-Open No. 267171/1991. In particular, a plastic film having a removable pressure-sensitive adhesive is pressed against the surface of an assembled automobile finished with a sprayed coating, using a vacuum. Thus, the body surface is coated with this plastic film. In this way, the coating surface of the finished automobile is temporarily protected.

With respect to small parts, a strippable paint has been sprayed on them to form a protective film.

In the above-described ~~prior art~~ Known method consisting of coating the body surface with a plastic film, the whole surface of the automobile is covered with the protective film. Therefore, the protective film is stuck even on those portions which are not required to be protected such as the windshield. This leads to a cost increase.

Where a strippable paint is employed, it is possible to protect only desired portions. However, if the sprayed object is large such as an automobile, the protective film lacks uniformity because of nonuniform drying, the film is damaged by matter adhering to the surface of the coating, or other problems take place.

Where a strippable paint is applied to the surface of the coating of a finished automobile in an attempt to form a protective film for the coating, dust or the like often adheres to the surface of the coating. Also, dirty water may adhere to the surface. Furthermore, it may be wetted with rainwater or

the like. In these situations, appropriate and smooth formation of the protective film is hindered when a strippable paint is applied. Moreover, the temperature of the surface of the coating drops. This makes it difficult to form a protective film on the surface of the coating.

Where a strippable paint is applied, the fringes of a region to be applied with the paint are applied with the paint, using a brush or a roller. Then, the paint is sprayed against the inner applied region surrounded by the fringes. In this way, a masking operation is dispensed with.

However, in some cases, components which are not required to be sprayed with paint such as windshield washer nozzles are located around the center of the region to which a strippable paint is applied. The washer nozzles are holes for ejecting cleaning liquid toward the windshield. In these cases, if the paint is sprayed against the hood after the paint ~~is~~ has been applied to the fringes of the washer nozzles with a brush or nozzle, it is considerably difficult to perform the spraying operation in such a way that the paint does not adhere to the washer nozzles. Moreover, the strippable paint may be directly applied to the entrances to the windshield washer nozzles or enter the nozzles. Furthermore, dust of the paint may enter the nozzles. As a result, a film of the paint is formed at the entrances to the nozzles or even inside the nozzles. Hence, extra steps must be carried out to remove the film.

Where the roof of an automotive body ~~is openable~~ may be opened such as a sliding roof, a conceivable paint application method consists of first applying the paint to the vicinities of the opening in the roof and to the vicinities of the engaging portion of the roof with a brush or roller and then spraying the paint against the remaining desired portions. However, a sealing member made of rubber is mounted around the opening in the roof and acts as a seal when the sliding roof is in a closed state. Therefore, there is the possibility that dust of the strippable paint enters the gap between the rubber seal and the sliding roof.

Side ~~winkers~~ turning lights which are mounted to right and left fenders, respectively, on an automotive body via rubber seals have similar drawbacks. Therefore, a ~~work~~ procedure for removing the protective film of a strippable paint is inevitable ~~at~~ the destination. This ~~work needs~~ procedure involves numerous steps.

SUMMARY OF THE INVENTION

The present invention has been made to solve these various problems.

A first embodiment of the present invention resides in a method of forming a protective film on the surface of a large-sized product finished with a sprayed coating, such as an automotive body, by applying a strippable paint to the product. Before the strippable paint is applied to the product, contaminations on the coating surface such as dust and ~~soil~~ dirt due

to rainwater are removed as a pretreatment step. This pretreatment step consists of a washing step using warm water and a dehydrating step using ~~air blowing which utilizes~~ blown hot air.

In this pretreatment step, ~~contaminations~~ contamination, such as dust, dirty water, and rainwater, adhering to the surface of the sprayed coating on an automotive body on which a protective film is to be formed are removed. This assures that a strippable paint ~~is~~ will be smoothly and effectively applied to the coating surface on the automotive body.

In a second embodiment of the invention, the step ~~for~~ of applying a strippable paint to a large-sized product finished with a sprayed coating, such as an automotive body, to form a protective film on the surface of the coating ~~consists~~ comprises steps of applying the strippable paint to the product, preliminarily drying the product to which the paint has been applied, and then non-preliminarily drying the product. In this way, the protective film is formed on the surface of the sprayed coating of the product. The temperature at which the non-preliminary drying is effected is preferably 60 to 90°C.

In the second embodiment of the invention, it is assured that a uniform protective film is formed on the surface of a large-sized product finished with a sprayed coating, such as an automotive body, by applying and drying ~~a~~ the strippable paint.

In a third embodiment of the invention, a paint

application ~~machine~~ apparatus for forming the protective film ~~out.~~ of the strippable paint in the second embodiment described above is provided to carry out the method for applying the paint. The ~~machine~~ apparatus comprises a booth for applying the paint to the sprayed product, a preliminary drying furnace for preliminarily drying the strippable paint applied to the sprayed product, and a non-preliminarily drying furnace for non-preliminarily drying the product preliminarily dried. The preliminary drying furnace uses an infrared drying furnace. A hot air drying furnace is employed as the non-preliminary drying furnace.

In a fourth embodiment of the invention, a method for spraying a strippable paint ~~against~~ on a large-sized product finished with a sprayed coating, such as an automobile, and equipped ~~either~~ with holes for ejecting liquid near the center of the outer sprayed coating surface of the body ~~or~~ and/or with parts in which the airtightness is enhanced by sealing members such as rubber seals, consists of masking a range considerably wider than the applied region containing the ejecting holes ~~and~~ and/or the ~~components~~ parts with enhanced airtightness, spraying the strippable paint ~~against~~ on the product, removing the masking materials, and amending the paint around the holes ~~and~~ and/or the ~~components~~ parts with enhanced airtightness. In this way, a protective film is formed by spraying the strippable paint.

In the fourth embodiment of the invention, the strippable paint for protecting the sprayed coating on a large-sized product such as an automotive body is applied to the product to

form a protective film. At this time, the paint is not sprayed ~~against~~ on those components to which the strippable paint is not required to be applied, such as sealing members for windshield washer nozzles, the sealing member for the opening in the sliding roof, and components such as ~~winkers.~~ side lights. As a result, a cumbersome operation ~~for~~ of removing the protective film, which would normally be needed ~~if~~ in conventional methods because the strippable paint and its dust erroneously adheres to the above-described components, is made unnecessary.

The present invention also provides a method and ~~machine~~ apparatus for forming a protective film on the surface of the sprayed coating of a large-sized product such as an automotive body by applying a strippable paint, based on a combination of the methods of the aforementioned first ~~or~~ and second embodiment. The ~~present~~ combination method consists of ~~applying the strippable paint to the sprayed coating of the product,~~ performing a pretreatment step for removing contaminations from the surface of the coating prior to formation of the protective film on the product, then applying the strippable paint to the pretreated product, preliminarily drying the product to which the paint has been ~~preliminarily~~ applied, and non-preliminarily drying the preliminarily dried product, thus forming the protective film on the surface of the sprayed product.

The invention also includes an automobile assembly method including a strippable paint coating step, the assembly method

comprising a pressing step of forming panel parts by plastic working thin sheet steel, a welding step of forming an automobile body by welding the panel parts together, a painting step of painting the surface of this automobile body, a subsequent assembly step of mounting an engine and functional parts and the like on the body, anti-scratch cover fitting and removal steps disposed before and after the assembly step, a strippable paint coating step of coating the painted surface of the finished automobile assembled in the assembly step with a strippable paint, and a final inspection step.

By interposing a strippable paint coating step between the above-mentioned painting and assembly steps so that the engine and functional parts and the like are assembled after a protective film is formed, the above-mentioned anti-scratch cover fitting and removal steps can be made unnecessary.

With this kind of method, compared to a case where strippable paint coating is carried out after the automobile is finished as has been the norm, the adhesion of dust and the like occurring in the assembly step, or in the assembly step and the inspection step, can be prevented, and the amount of equipment required and the number of manufacturing steps involved can be reduced and cost reductions achieved.

Other objects and features of the invention will appear in the course of the description thereof, which follows.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

Fig. 1 is a block diagram of illustrating successive steps of a method of forming a protective film on the surface of a large-sized product finished with a sprayed coating by applying a strippable paint according to the present invention, the successive steps containing a pretreatment step consisting of applying the strippable paint for forming the protective film and a subsequent drying step consisting of multiple drying stages ~~applying the strippable paint~~;

Fig. 2 is a plan view illustrating a method consisting of masking windshield washer nozzles and spraying a strippable paint according to the invention;

Fig. 3 is an enlarged cross section taken on line 3-3 of Fig. 2;

Fig. 4 is a side elevation illustrating a method consisting of masking turning lights ~~winkers~~ mounted at front fenders and spraying a strippable paint according to the invention;

Fig. 5 is an enlarged cross section taken on line 5-5 of Fig. 4;

Fig. 6 is a block diagram illustrating successive steps of a method of forming a protective film where the sprayed coating surface contains regions on which the protective film is not required to be formed such as illustrated in Figs. 2-5;

Fig. 7 is a block diagram of an automobile assembly process including a strippable paint coating step; and

Fig. 8 is a block diagram of another preferred embodiment of an automobile assembly process including a strippable paint coating step.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The preferred embodiments of the present invention are hereinafter described in detail by referring to the accompanying drawings. Fig. 1 illustrates successive steps for carrying out application of a strippable paint to form a protective film on a large-sized product finished with a sprayed coating, according to a preferred embodiment of the invention. The successive steps contain a step (pretreatment) carried out prior to application of the strippable paint and the subsequent steps consisting of applying the strippable paint and drying the strippable paint.

In the illustrated example, the product having the sprayed coating to which the strippable paint is applied so as to form the protective film is an automobile. The body of this automobile is finished with a sprayed coating. Various appliances and components are incorporated in the body, thus producing a finished automobile. Then, the automobile is kept in stock and shipped. Emphasis is placed on the coating of the automobile for the sake of appearance, and the automobile is a large-sized product.

Before the automobile is shipped in this way, a strippable paint is applied to the surface of the coating of the body to

form a protective film.

The successive steps are next described by referring to Fig. 1. The preferred embodiment of the invention is described now. The automobile once manufactured and kept in stock and will be shipped. Contaminations such as dust, dirty water, water such as rainwater adhere to the surface of the sprayed coating of the automobile. To form the protective film on this surface of the coating, the strippable paint is applied to the surface. Before the application of this paint, a pretreatment step is carried out. That is, it is necessary to remove contaminations such as dust, dirty water, water such as rainwater from the surface of the coating. Hence, the pretreatment step 3 is conducted before the strippable paint is applied to form the protective film for the coating of the automobile.

In the pretreatment step 3, the sprayed coating surface is cleaned with clean water to remove contaminations such as dust, dirty water, and rainwater. This is designated washing step 1. In this washing step, a shower washer is used to prevent the surface of the coating from being scratched. In the washing step, room-temperature water normally is used. However, in cold-weather conditions, warm water is preferably used.

The automobile which has undergone the washing step 1 described above is transported by an appropriate conveying machine 10 such as a conventional hand truck or conveyor to the next station where a dehydrating step 2 is carried out. In the

washing step 1, the surface of the sprayed coating of the automobile is wetted with water, which is required to be removed. In the dehydrating step 2, air is blown against the wetted surface of the coating of the automobile to remove the moisture from the surface of the body. In cold seasons, hot air is preferably used as the blown air, for the following reason. Where warm water is employed in the previous washing step 1, the air blowing step is effected, using hot air, in conformity with the warm water to maintain the surface of the coating of the automobile when sent to the next step at an appropriate temperature. The optimum temperature of the surface of the coating having undergone the washing step 1 and the dehydrating step 2 is 10 to 25°C.

In the case of an automobile having a displacement of the order of 2000 cc, if the temperature of the ambient surrounding the surface of the coating is -5°C, and if warm water of 40°C is sprayed against the surface of the coating at a rate of 1.5l/min ~~1.5/min.~~ then a surface temperature of 18°C ± 2°C is obtained in 15 seconds.

In the pretreatment step 3 consisting of the washing step 1 and the dehydrating step 2 described thus far, when the automobile is kept in stock before being shipped, contaminations adhering to the surface of the coating of the automobile such as dust, dirty water, and rainwater are washed away. As a result, before the strippable paint is applied to

form the protective film, the applied surface is cleaned with certainty. Therefore, the paint can be appropriately, reliably ~~certainly~~, and smoothly applied, and the protective film is effectively formed on the surface of the coating.

The second preferred embodiment of the invention, which is a method of forming a protective film on the surface of the sprayed coating of a product, is next described. The automobile which has undergone the pretreatment step 3 described above has its coating surface cleaned. The automobile is then conveyed by the conveying machine 10 to the next station where an application step is carried out to apply the strippable paint for forming the protective film. The application step, indicated by 6, is conducted inside an application booth 4 which is similar in structure to a paint application booth normally used. However, because a water-soluble strippable paint is preferably used, it is necessary to give considerations to the temperature and moisture inside the booth.

Where a water-soluble strippable paint is used, it is desired that the temperature and the moisture inside the booth be in ranges of 10-25°C and 50-80%, respectively. As an example, Lapguard prepared by Kansai Paint Co., Ltd, Japan, was used as the water-soluble strippable paint, and it was applied inside the application booth 4 under the above-described temperature and moisture conditions.

Where the above-described water-soluble strippable paint

is used, the protective film might not be appropriately formed ~~out of~~ from the paint if the temperature and the moisture are outside the above-described ranges. Any desired means can be employed to apply the strippable paint. For example, a brush, a roller, or a spray gun may be used.

After the strippable paint has been applied inside the application booth 4 in this way, the automobile is conveyed to ~~the~~ a next station where a drying step, indicated by 9, is carried out. Prior to this conveyance, the automobile is moved into a setting booth 5. In the present example, the automobile is passed through the setting booth 5 between the application step 6 and the drying step 9. Normally, the temperature of the ambient inside the setting booth 5 is 15 to 30°C, and the humidity is 50 to 80%. In this setting booth 5, the automobile is allowed to stand for a long time after the application of the strippable paint before the drying step to cause the formed film to stabilize. The subsequent drying step 9 consists of preliminary drying and non-preliminary drying.

After the automobile to which the strippable paint has been applied has been moved out of the setting booth 5, the automobile is conveyed into a preliminary drying booth 7 to perform a preliminary drying step ~~previous to the drying step 9~~.

An infrared drying furnace is used as a heat source in the preliminary drying furnace 7 to promote the drying of the protective film from inside thereof the protective film being formed on the surface of

the coating. Preferably, the water-soluble strippable paint is illuminated with infrared radiation having wavelengths of 2 to 4 μm for 30 to 60 seconds. If the drying process is ~~started~~ initiated from the outer surface of the protective film, holes or cracks will be formed in the surface of the protective film because of solvent or water emerging from inside thereof, thus deteriorating the performance of the protective film. Hence, the drying is preferably accelerated from inside the protective film.

After the automobile is preliminarily dried in the preliminary drying furnace 7 as described above, the automobile is conveyed by the conveying machine 10 into a rear-stage, non-preliminary drying furnace 8 where the automobile is dried in a non-preliminary manner. A hot air drying furnace is preferably used as the non-preliminary drying furnace 8 because it is possible to uniformly heat the object to which the paint should be applied. With respect to the temperature conditions under which the hot air drying process is carried out, the automobile to which the present invention is applied is a finished automobile incorporating various electrical appliances and other accessories ~~accessaries~~ that are vulnerable to heat. Therefore, in order to protect these appliances and accessories ~~accessaries~~, the drying temperature is preferably in the range from 60 to 90°C. If a drying process is carried out within this range, the electrical appliances and accessories ~~accessaries~~ can be prevented from being deteriorated in quality and ~~or~~ characteristic.

The layout of the application booth used for the application step and the drying step for the ~~application of~~ applying the strippable paint and ~~the formation of~~ forming the protective film, the preliminary and non-preliminary drying ~~furnace~~ used for the drying step, and ~~the non-preliminary drying furnace forms~~ form the third embodiment of the invention.

Where the protective film is formed by the application of the strippable paint as described above, the application and drying of the paint can be continuously, appropriately, ~~certainly~~ reliably, smoothly, and efficiently conducted. Furthermore, the protective film can be formed uniformly. ~~Especially~~ Particularly, when the water-soluble strippable paint is dried, the preliminary drying furnace for effecting the preliminary drying step is ~~provided. The preliminary drying is~~ effected by irradiation of infrared radiation. In consequence, a uniform protective film having desired thickness and having neither holes nor cracks can be obtained.

The fourth embodiment of the present invention is now described by referring to Figs. 2-6. Fig. 6 is a block diagram illustrating the successive steps of this embodiment.

Shown in Fig. 2 is a hood 11 forming an example of an outer sprayed coating surface of an automobile. Two windshield washer nozzles 12 are formed on opposite sides of the center of the hood 11 to spray cleaning liquid against the windshield, for cleaning it.

Where a protective film is formed by spraying a strippable paint 13 on the hood 11, the following steps are carried out. First, a masking step 21 is conducted. That is, masking paper 14 is stuck on a region which is somewhat wider than each washer nozzle 12 existing inside the region, i.e., the hood surface, to which the strippable paint 13 is to be applied. Thus, the nozzle is covered. In Fig. 2, the masking paper 14 is shown to be stuck on the region around the right one of the washer nozzles 12; the left one is shown as it is to show one nozzle clearly. Then, a spraying-and-applying step 24 is effected, i.e., the strippable paint 13 is sprayed to apply the paint 13 to the coating surface of the hood 11. Thereafter, the masking paper 14 and pressure-sensitive adhesive tape 15 are removed. This is referred to as the peeling step 25. Finally, a repairing application step 26 is carried out. That is, the strippable paint 13 is applied to the surroundings of the washer nozzle 12 so as to repair the film. Subsequently, the repaired portion is subjected to a drying step 27.

In the masking step 21, a step 22 consisting of covering the washer nozzle 12 with a circular piece of masking paper 14, as illustrated in Fig. 2, is first performed. Then, the annular pressure-sensitive adhesive tape 15 is stuck on the coating surface of the hood 11 around the masking paper 14 (step 23). Conventional ~~Generally used~~ masking paper and pressure-sensitive adhesive tape may be employed as the masking paper 14 and the pressure-

sensitive adhesive tape 15, respectively. A commercially available masking roll paper can be used as the masking paper 14. A pressure-sensitive adhesive tape manufactured by Nichiban Co., Ltd, Japan, is used as the adhesive tape 15.

In the next spraying-and-applying step 24, the strippable paint 13 is sprayed against the whole hood 11 including the masking paper 14 and the pressure-sensitive adhesive tape 15. The paint 13 is so sprayed that a desired protective film is formed on the surface of the hood 11 which is a coating surface. The method of spraying the paint may be either air spray or airless spray. The method may be selected according to the viscosity of the strippable paint 13.

In the peeling step 25, the masking paper 14 and the pressure-sensitive adhesive tape 15 on and around the washer nozzle 12 are peeled off.

Then, the repairing application step 26 is performed. In particular, after peeling off the masking paper 14 and the pressure-sensitive adhesive tape 15, the strippable paint 13 is applied to the unapplied region appearing around the nozzle 12, using a brush.

After completing these steps, the drying step 27 is carried out by air drying or forced drying to form a protective film around the masked portion.

As shown in Fig. 4, a side ~~winker~~ turning light 17 for indicating the direction of movement of the automobile is mounted on the front

fender 16 together with rubber seal 18, the fender 16 forming an outer sprayed coating surface of the automobile.

Where the strippable paint 13 is sprayed on the front fender 16, a protective film is formed in the same way as in the above-described process. That is, the paint is applied by carrying out the masking step 21 for masking the unapplied region, the spraying-and-applying step 24, the masking peeling step 25, the repairing application step 26, and the drying step 27.

Also in this example, the strippable paint 13 is sprayed after desired portions are masked in the same way as in the case of the hood. More specifically, masking paper 19 is stuck on a region that is somewhat wider than the side ~~winker~~ turning light 17 located inside the region to which the paint 13 is to be applied so as to cover the ~~winker~~ turning light 17. The fringes of the masking paper 19 are fixed with pressure-sensitive adhesive tape 20. Then, the strippable paint 13 is sprayed on the coating surface of the fender 16 including the masking paper 19 and the tape 20. In this way, the paint 13 is applied to the coating surface of the front fender 16. Thereafter, the masking paper 19 and the peripheral adhesive 20 are peeled from the coating surface. The paint 13 is then applied with a brush to the unapplied region located around the side ~~winker~~ turning light 17. Natural drying or forced drying is selected and carried out in the same way as the foregoing embodiment. A protective film is formed on

this portion.

In the present example, the strippable paint is not applied to those portions which are not required to be coated with the protective film of the strippable paint. This makes it unnecessary to perform a cumbersome and complex strippable paint-removing ~~work~~ procedure at the destination. Furthermore, when the masking step is carried out, a region somewhat wider than the masked object is masked and, therefore, no parting step is necessary. As a result, the masking work is facilitated.

On automobile assembly lines, rustproofing wax or strippable paint is coated onto the painted surfaces of automobiles after they ~~pass~~ have been assembled and passed through a finished vehicle inspection step ~~after being assembled~~ in order to prevent scratching of the painted surfaces of the automobile bodies and the adhesion of dust and the like thereto. The strippable paint is coated onto the painted surfaces as described above.

Conventionally, as mentioned above, because coating of the strippable paint is often carried out in a separate step after the finished vehicle inspection step ~~after the automobile is assembled~~, there have been the following kinds of problems:

In order to prevent the adhesion of dust and dirt to the automobile body and to prevent scratching thereof in the assembly steps after painting of the automobile body, an anti-scratching cover is necessary, and steps of fitting and removing this anti-scratching cover relative to the vehicle body are necessary. As a

result, equipment and manufacturing steps for both scratch-prevention and strippable paint coating are required. ~~Because~~ Consequently, ~~consequently~~ because a lot of equipment and numerous manufacturing steps are required and the equipment and manufacturing steps are discontinuous, ~~and therefore~~ an independent, separate coating equipment space is necessary in the conventional method, so that this method is disadvantageous from the space-efficiency viewpoint. Also, strippable paint coating equipment and a coating step completely separate from the steps and equipment which were continuous up to the finished vehicle inspection step are necessary and in some cases a double investment in equipment and manufacturing steps is involved, and consequently the method is disadvantageous from the economic viewpoint also. Furthermore, individual and overall cost increases and increases in man-hours result, and the method is therefore also disadvantageous from the cost reduction and man-hour reduction viewpoints.

Therefore, a strippable paint coating step by which the above-mentioned strippable paint coating can be carried out efficiently in terms of equipment and space and with which scratching of the painted surfaces of the product and the adhesion of dust thereto can be suitably and effectively prevented is called for.

~~With this~~ According to the present invention a production line satisfying this need can be provided, and preferred embodiments of the invention

with which these kinds of problem also can be solved will now be described in detail.

Fig. 7 and Fig. 8 show in order the manufacturing steps of two such preferred embodiments, respectively.

Fig. 7 is a block diagram showing a first preferred embodiment of an automobile assembly process including a strippable paint coating step. In this preferred embodiment, first, in a pressing step 31, panel parts are formed by plastically working thin sheet steel. **The pressed panel parts are** then provisionally assembled using jigs or the like and **transferred by a conveyor not shown in the drawings to a welding step 32. In the welding step 32** the panel parts are welded together by spot welding or the like to form an automobile body. The surface of this automobile body is painted in a painting step 33 ~~before painting is carried out~~ involving a conversion treatment ~~ordinarily performed is~~ carried out on the automobile body, ~~and~~ after which paint is then coated onto the body surface and the painting step 33 thereby completed. Although ~~this is~~ not shown in the drawings, after painting the automobile ordinarily goes through a drying step ~~ordinarily performed~~ and the paint is thereby dried to complete the painting step 33.

After going through the above-mentioned painting step the automobile body is conveyed to an assembly step 34 and an engine and functional parts are fitted thereto. An anti-scratch cover fitting step 37 and an anti-scratch cover removal

step 38 are provided before and after the assembly step 34. An anti-scratch cover ~~conveying~~ Conveyor apparatus 39 links these steps 37 and 38, and this anti-scratch cover ~~conveying~~ Conveyor apparatus 39 conveys covers removed in the anti-scratch cover removal step 38 and returns them to the anti-scratch cover fitting step 37 for reuse.

Finished automobiles assembled in the assembly step 34 are conveyed as they are to the next step which is a strippable paint coating step 35. In this strippable paint coating step 35 a strippable paint which forms a protective film on the painted body surface is coated onto the ~~above-mentioned region~~ Surface and goes through a drying step as above and a protective film is thereby formed on the body surface. In this way a painted, finished automobile with its painted surfaces protected by a protective film is obtained. This is followed by a finished vehicle inspection step 36 wherein the conformity to specifications of the finished automobile assembled and coated with strippable paint are checked.

According to the above embodiment, because strippable paint coating is carried out immediately after the assembly step is completed, scratching and adhesion of dust and the like occurring between the assembly step and the completed vehicle inspection step can be prevented.

Fig. 8 is a block diagram showing in order the steps of a second preferred embodiment of an automobile assembly process

including a strippable paint coating step. This second preferred embodiment of an automobile assembly process including a strippable paint coating step will now be described with reference to Fig. 8. Basically, most of the steps are common with those of the first preferred embodiment of Fig. 7 ~~described above~~.

In the automobile assembly process shown in Fig. 8, first, in a pressing step 41, panel parts are formed by plastically working thin sheet steel. **The pressed panel parts are** then provisionally assembled using jigs or the like and **transferred by a conveyor not shown in the drawings to a welding step 42. In the welding step 42** the panel parts are welded together by spot welding or the like to form an automobile body. The surface of this automobile body is painted in a painting step 43; involving ~~before painting is carried out.~~ a conversion treatment after which ~~ordinarily performed is carried out on the automobile body, and.~~ paint is then coated onto the body surface and the painting step 43 thereby completed. Although not shown in the drawings, after being painted the automobile ordinarily goes through a drying step ~~ordinarily performed~~ and the paint is thereby dried to complete the painting step 43.

After the above-mentioned painting step 43 and before the assembly step 44, a strippable paint coating step 45 is interposed. In the strippable paint coating step 45, strippable paint is coated onto the painted surface of the

automobile body having passed through the painting step 43. After the strippable paint is coated, it ~~coating, the strippable paint~~ is dried by going through for example infrared drying and/or ~~or~~ hot-air drying as above, and a protective film is formed on the painted surface.

After that, as above, the automobile body is conveyed to an assembly step 44 and an engine and functional parts are mounted thereon. In this preferred embodiment, because the strippable paint coating step 45 is interposed after the painting step 43 and before the assembly step 44, the kind of anti-scratch cover fitting and removal steps provided before and after the assembly step in the preferred embodiment of Fig. 7 are unnecessary.

Completed automobiles assembled in the assembly step 44 are conveyed as they are to the next and final step, the finished vehicle inspection step, and finished vehicle inspections are carried out.

According to this preferred embodiment, together with the effect that it is possible to prevent scratching and the adhesion of dust from occurring between the above-mentioned assembly step and the finished vehicle inspection step, as mentioned above the anti-scratch cover fitting and removal steps provided before and after the assembly step become unnecessary. It is notable in this connection that in the work of assembling the engine and functional parts to the body in

the assembly step 44, dust and the like are unavoidable. However, as a result of the automobile bodies going through the strippable paint coating step 45 a strong protective film is formed on the painted surface by the strippable paint coating. Consequently, even if dust or the like occurring in the assembly step alights on the painted surface it is prevented from affecting the painted surface and even if in the assembly step dirt alights on the painted surface of the body it can easily be removed by a subsequent simple wiping-off. With this preferred embodiment, as described above, because anti-scratch cover fitting and removal steps are unnecessary, cost and labor reductions can be achieved.

TP add A10 >

WHAT IS CLAIMED IS:

1. A method of forming a protective film on a surface of a large-sized product, such as an automobile, finished with a sprayed coating by applying a strippable paint to a surface of the sprayed coating, said method comprising the steps of:

removing contaminations from the surface of said sprayed coating of said product; and

then applying the strippable paint so as to form the protective film.

2. The method of claim 1, wherein said step of removing contaminations consists of a washing step for washing the surface of the sprayed coating of said product and a subsequent dehydrating step.

3. The method of claim 2, wherein said washing step is carried out, using warm water.

4. The method of claim 2, wherein said dehydrating step is carried out by making use of air blow.

5. The method of claim 4, wherein said air blow makes use of hot air.

6. The method of claim 2, wherein said washing step makes use of warm water, and wherein said dehydrating step makes use of hot air.

7. The method of claim 2, wherein said step for washing the surface of the sprayed coating of said product is shower washing such as washing of an automobile, using shower.

8. A method of forming a protective film on a surface of a large-sized product finished with a sprayed coating, such as an automobile, by applying a strippable paint to a surface of said sprayed coating, said method comprising the steps of:

applying said strippable paint to said product;

preliminarily drying said strippable paint applied to said product; and

then non-preliminarily drying said product.

9. The method of claim 8, wherein said step of preliminarily drying said strippable paint makes use of infrared irradiation.

10. The method of claim 8, wherein said step of non-preliminarily drying said product makes use of hot air drying.

11. The method of claim 8, wherein said step of non-preliminarily drying said product is carried out at a temperature of 60 to 90°C.

12. The method of claim 8, wherein said strippable paint is a water-soluble strippable paint, and wherein said strippable paint is applied within a space isolated from surroundings at a temperature of about 10-25°C at a humidity of about 50-90%.

13. The method of claim 9, wherein said strippable paint is a water-soluble strippable paint, and wherein said step of preliminarily drying said protective film formed by applying ~~said water-soluble strippable paint is carried out by~~

irradiating infrared radiation having a wavelength of about 2 to 4 μm for about 30 to 60 seconds.

14. Apparatus ~~A machine~~ for forming a protective film on a surface of a large-sized product finished with a sprayed coating ~~such as an automobile~~ by applying a strippable paint to a surface of said sprayed coating, said apparatus ~~machine~~ comprising:

an application booth for applying ~~said~~ strippable paint to said product;

a preliminary drying furnace for preliminarily drying the strippable paint applied to said product; and

a non-preliminary drying furnace for non-preliminarily drying said product already preliminarily dried.

15. The machine of claim 14, wherein said preliminary drying furnace is an infrared drying furnace.

16. The machine of claim 14, wherein said non-preliminary drying furnace is a hot air drying furnace.

17. A method of forming a protective film on a surface of a product finished with a sprayed coating and having an outer coating surface provided with holes for ejecting liquid or equipped with components whose airtightness has been enhanced by sealing members or the like and to which a strippable paint is not applied such as an automobile, by spraying said strippable paint against said product, said method comprising the steps of:

masking a region with a masking material on said sprayed

coating surface, said region being wider than an unapplied region to which the strippable paint is not to be applied;

spraying said strippable paint against said coating surface of said product including said unapplied region to form a film;

peeling said masking material from said unapplied region containing said holes or components; and

applying said strippable paint to unapplied regions remaining around said holes or components so as to repair said film of said strippable paint.

18. A method of forming a protective film on a surface of a large-sized product finished with a sprayed coating such as an automotive body by applying a strippable paint to a surface of said sprayed coating, said method comprising the steps of:

washing away contaminations such as dust, dirty water, and rainwater from said surface of said coating of said product;

subsequently applying said strippable paint;

preliminarily drying said product to which said strippable paint has been applied; and

then non-preliminarily drying said product.

19. A machine for forming a protective film on a surface of a large-sized product finished with a sprayed coating such as an automobile by applying a strippable paint to a surface of said sprayed coating, said machine comprising:

a pretreatment device including a washing device for

washing away contaminations such as dust, dirty water, and rainwater from said surface of said coating of said product and a dehydrating device;

an application booth for applying said strippable paint, said booth being located contiguous with said pretreatment device;

a preliminary drying furnace for preliminarily drying the strippable paint applied to said product; and

a non-preliminary drying furnace for non-preliminarily drying said product already preliminarily dried.

20. A method for forming a protective film on a large paint-finished product such as an automobile including a step of applying strippable paint, comprising a step of coating strippable paint on a painted surface of the large paint-finished product after a step of painting the large paint-finished product.

21. A method for forming a protective film on a surface of a large-sized product, such as an automobile, finished with a sprayed coating according to claim 1 or claim 17, further comprising a step of coating strippable paint on a painted surface of the product after a painting step of painting the product.

22. A method for forming a protective film on a large paint-finished product such as an automobile according to claim 20 or claim 21, wherein a step after the painting step is an

assembly step of mounting an engine and functional parts and the like and a step after this assembly step is a strippable paint coating step.

23. A method for forming a protective film on a large paint-finished product such as an automobile according to claim 22, wherein anti-scratch cover fitting and removal steps are provided before and after the assembly step.

24. A method for forming a protective film on a large paint-finished product such as an automobile according to claim 22, wherein a step after the strippable paint coating step following the assembly step is a completed product inspection step.

25. A method for forming a protective film on a large paint-finished product such as an automobile according to claim 20 or claim 21, wherein a step after the painting step is a strippable paint coating step and an assembly step of mounting an engine and functional parts and the like is disposed after the strippable paint coating step.

26. A method for forming a protective film on a large paint-finished product such as an automobile according to claim 25, wherein a step following the assembly step is a finished product inspection step.

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ABSTRACT OF THE DISCLOSURE

There are disclosed a method and ~~a machine~~ apparatus for applying a strippable paint to a large-sized product finished with a sprayed coating, such as an automobile, to form a protective film on the surface of the coating. The product is conventionally kept in stock for a period of time before it is ~~and will be~~ shipped. Contaminations such as dust are washed away from the surface of the product. Then, the strippable paint is applied, preliminarily dried, and non-preliminarily dried to form the protective film out of the strippable paint on the surface of the coating. This protective film is formed easily, appropriately, and reliably ~~certainly~~. The obtained protective film has a uniform and sufficient thickness. Even if the surface contains unapplied regions to which the paint should not be applied, the paint can be applied to the whole surface of the coating while avoiding the unapplied regions according to the invention. The application can be performed easily and reliably ~~certainly~~ without leaving unapplied portions around the unapplied regions.

#14

FIG. 1

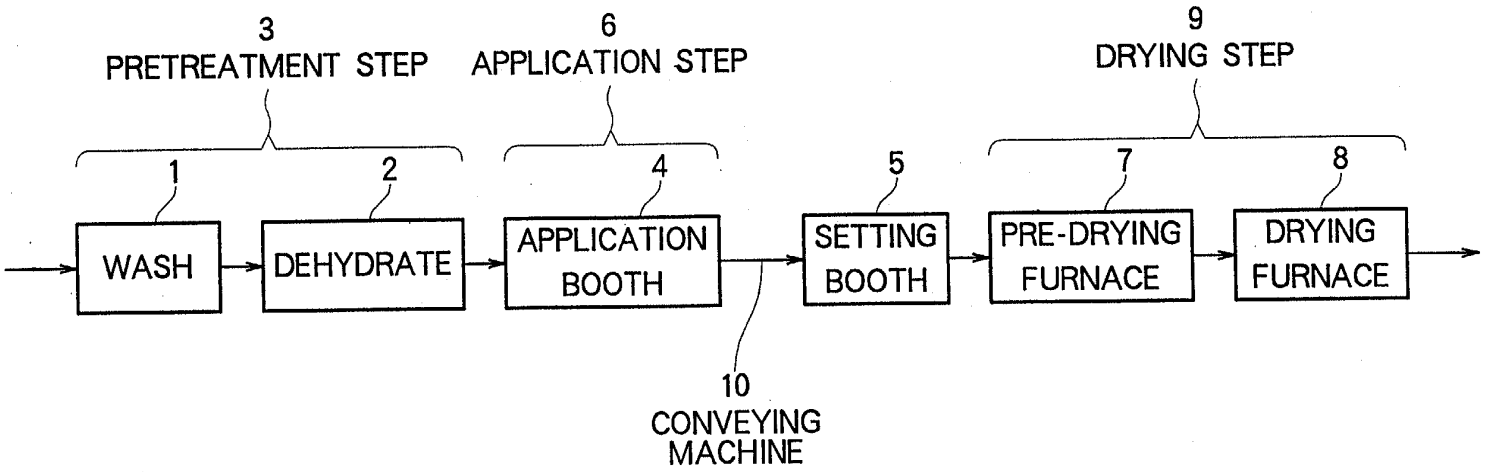


FIG. 2

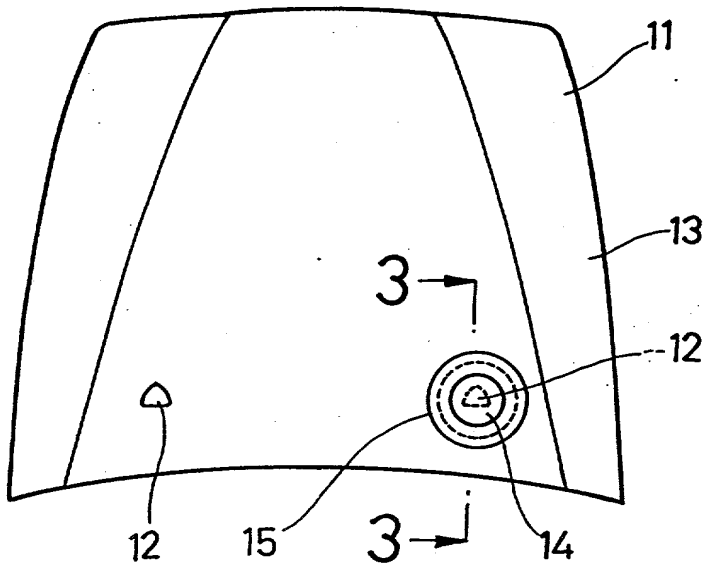


FIG. 3

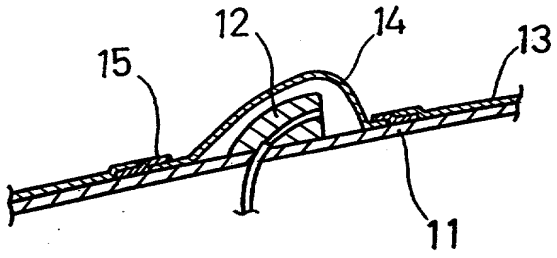


FIG. 4

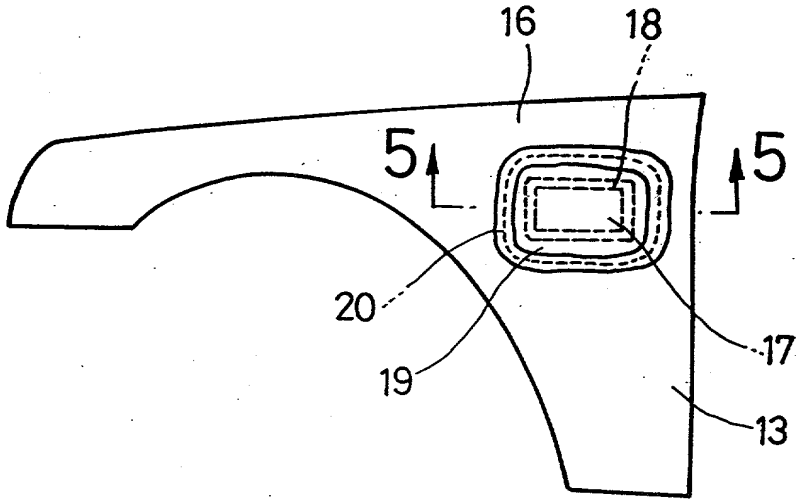


FIG. 5

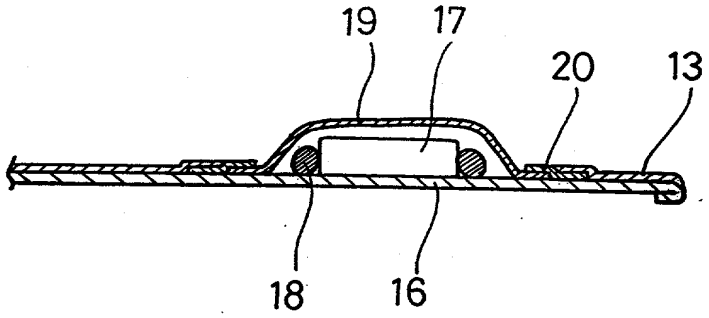


FIG.6

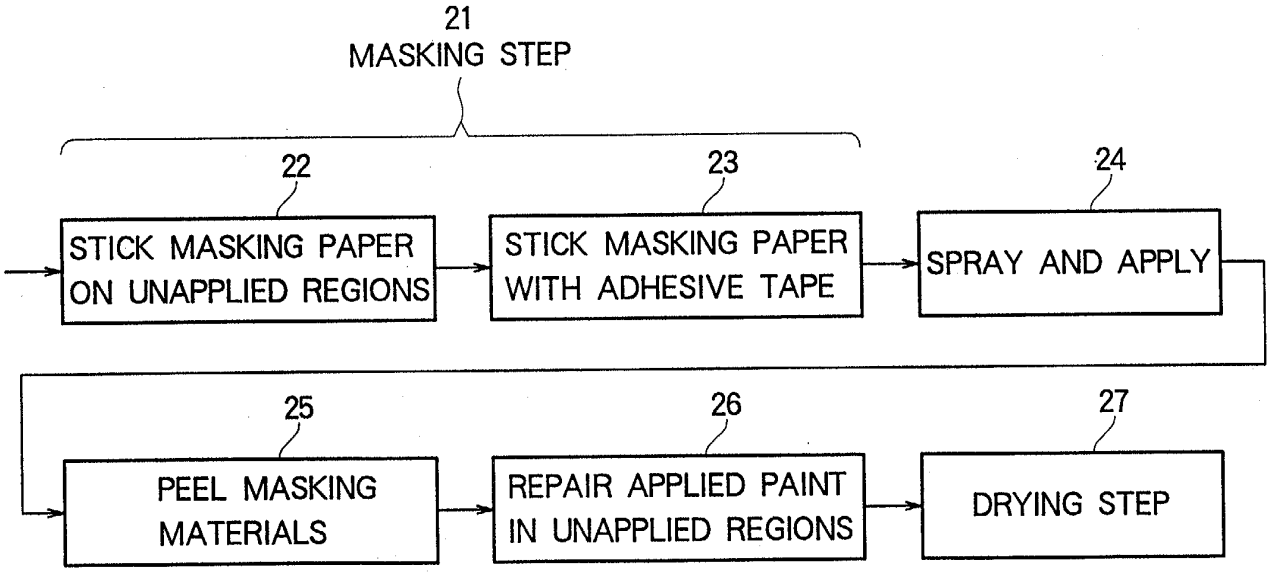
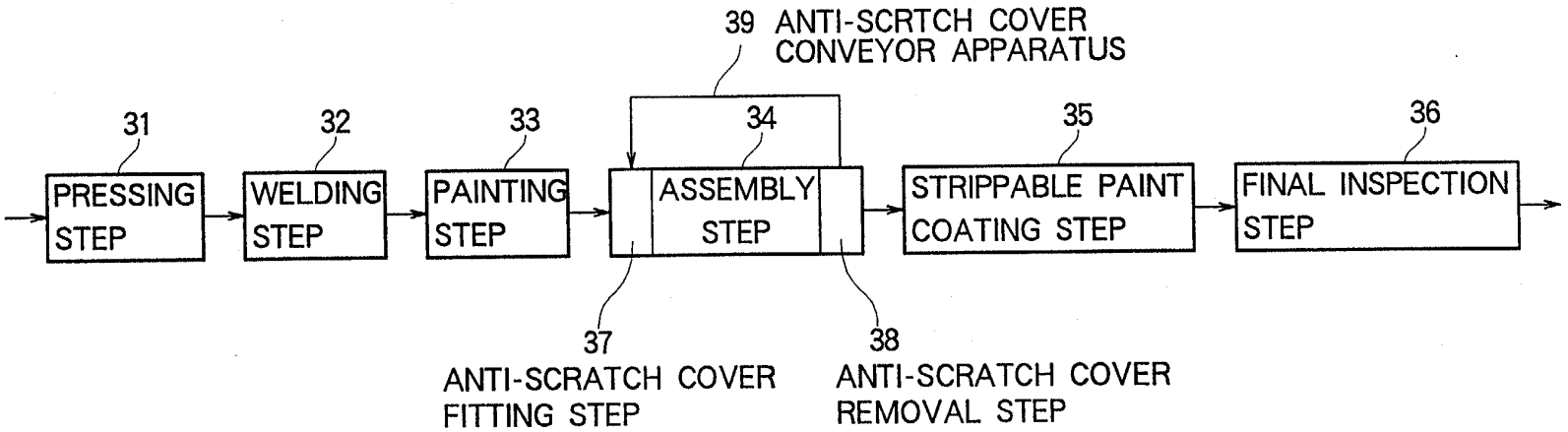


FIG. 7



Declaration and Power of Attorney For Patent Application

特許出願宣言書

Japanese Language Declaration

私は、下欄に氏名を記載した発明者として、以下のとおり宣言する：

As a below named inventor, I hereby declare that:

私の住所、郵便の宛先および国籍は、下欄に氏名に続いて記載したとおりであり、

My residence, post office address and citizenship are as stated below next to my name,

名称の発明に関し、請求の範囲に記載した特許を求める主題の本来の、最初にして唯一の発明者である（一人の氏名のみが下欄に記載されている場合）か、もしくは本来の、最初にして共同の発明者である（複数の氏名が下欄に記載されている場合）と信じ、

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Method And Machine For Forming Protective Film On Sprayed Coating Of Large-Sized Product

)明細書を
当する方に印を付す）

the specification of which
(check one)

ここに添付する。

XXXis attached hereto.

_____日に出願番号

☐ was filed on _____ as Application Serial No. _____

_____号として提出し、

_____日に補正した。
（該当する場合）

and was amended on _____
(if applicable)

私は、前記のとおり補正した請求の範囲を含む前記明細書の内容を検討し、理解したことを陳述する。

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

私は、連邦規則法典第37部第１章第56条（ａ）項に従い、本願の審査に所要の情報を開示すべき義務を有することを認める。

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

Japanese Language Declaration

私は、合衆国法典第35部第119 条にもとづく下記の外国特許出願または発明者証出願の外国優先権利益を主張し、さらに優先権の主張に係わる基礎出願の出願日前の出願日を有する外国特許出願または発明者証出願を以下に明記する：

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior foreign applications
先の外国出願

(Number) (番 号)	(Country) (国 名)	(Day/Month/Year Filed) (出願の年月日)	Priority claimed 優先権の主張 Yes あり	No なし
5-224370	Japan	9/September/1993	☐	☒
5-224372	Japan	9/September/1993	☐	☒
5-224373	Japan	9/September/1993	☐	☒

は、合衆国法典第35部第120 条にもとづく下記の合衆許出願の利益を主張し、本願の請求の範囲各項に記載題が合衆国法典第35部第112 条第１項に規定の態様で合衆国出願に開示されていない限度において、先の出出願日と本願の国内出願日またはＰＣＴ国際出願日の公表された連邦規則法典第37部第１章第56条（ａ）項載の所要の情報を開示すべき義務を有することを認め

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

pplication Serial No.) (出願番号)	(Filing Date) (出願日)	(現 況) (特許済み、係属中、放棄済み)	(Status) (patented, pending, abandoned)
pplication Serial No.) (出願番号)	(Filing Date) (出願日)	(現 況) (特許済み、係属中、放棄済み)	(Status) (patented, pending, abandoned)

私は、ここに自己の知識にもとづいて行った陳述がすべて真実であり、自己の有する情報および信ずるところに従って行った陳述が真実であると信じ、さらに故意に虚偽の陳述等を行った場合、合衆国法典第18部第1001条により、罰金もしくは禁錮に処せられるか、またはこれらの刑が併科され、またかかる故意による虚偽の陳述が本願ないし本願に対して付与される特許の有効性を損うことがあることを認識して、以上の陳述を行ったことを宣言する。

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Japanese Language Declaration

私は、合衆国法典第35部第119 条にもとづく下記の外国特許出願または発明者証出願の外国優先権利益を主張し、さらに優先権の主張に係わる基礎出願の出願日前の出願日を有する外国特許出願または発明者証出願を以下に明記する：

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Prior foreign applications
先の外国出願

(Number) (番 号)	(Country) (国 名)	(Day/Month/Year Filed) (出願の年月日)	Priority claimed 優先権の主張 Yes あり	No なし
5-224371	Japan	9/September/1993	☐	☒
			☐	☐
			☐	☐

は、合衆国法典第35部第120 条にもとづく下記の合衆許出願の利益を主張し、本願の請求の範囲各項に記載題が合衆国法典第35部第112 条第１項に規定の態様で合衆国出願に開示されていない限度において、先の出出願日と本願の国内出願日またはＰＣＴ国際出願日の公表された連邦規則法典第37部第１章第56条（ａ）項載の所要の情報を開示すべき義務を有することを認め

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.) (出願番号)	(Filing Date) (出願日)	(現 況) (特許済み、係属中、放棄済み)	(Status) (patented, pending, abandoned)

私は、ここに自己の知識にもとづいて行った陳述がすべて真実であり、自己の有する情報および信ずるところに従って行った陳述が真実であると信じ、さらに故意に虚偽の陳述等を行った場合、合衆国法典第18部第1001条により、罰金もしくは禁錮に処せられるか、またはこれらの刑が併科され、またかかる故意による虚偽の陳述が本願ないし本願に対して付与される特許の有効性を損うことがあることを認識して、以上の陳述を行ったことを宣言する。

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Japanese Language Declaration

委任状：私は、下記発明者として、以下の代理人をここに選任し、本願の手続を遂行すること並びにこれに関する一切の行為を特許商標庁に対して行うことを委任する。
（代理人氏名および登録番号を明記のこと）

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (*list name and registration number*)

Irving M. Weiner, Reg. No. 22,168;
Joseph P. Carrier, Reg. No. 31,748;
Pamela S. Burt, Reg. No. 27,861;
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(810) 344-4422

のまたは第一の発明者の氏名	Full name of sole or first inventor Hideaki Tojo 1-00
明者の署名 日付	Inventor's signature Date Hideaki Tojo 02/28/95
	Residence Saitama-ken, Japan JPX
国籍	Citizenship Japan
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	10-1, Shinsayama 1-chome, Sayama-shi Saitama-ken, Japan
第２の共同発明者の氏名（該当する場合）	Full name of second joint inventor, if any Hideo Ishida 2-00
同第２発明者の署名 日付	Second inventor's signature Date Hideo Ishida 02/28/95
住所	Residence Saitama-ken, Japan JPX
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（第六またはそれ以降の共同発明者に対しても同様な情報および署名を提供すること。）

(Supply similar information and signature for third and subsequent joint inventors.)

第三の共同発明者氏名	FULL NAME OF THIRD JOINT INVENTOR IF ANY Hisashi Kurota 3-00
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発明者の署名　日付	SIGNATURE Takao Arasawa 02/28/95
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（第六またはそれ以降の共同発明者に対しても同様な情報および署名を提供すること。）	

INVENTOR(S) TO BE LISTED ON FILING

第三の共同発明者氏名	FULL NAME OF SIXTH JOINT INVENTOR IF ANY Satoru Yamada
発明者の署名 日付	SIGNATURE *Satoru Yamada* DATE 02/28/95
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郵便住所	POST OFFICE ADDRESS c/o Honda Giken Kogyo, Saitamaseisakujo
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第四の共同発明者氏名 5-00	FULL NAME OF SEVENTH JOINT INVENTOR IF ANY Nobuyuki Okita
発明者の署名 日付	SIGNATURE *Nobuyuki, Okita* DATE 02/28/95
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国籍	CITIZENSHIP Japan
郵便住所	POST OFFICE ADDRESS c/o Honda Giken Kogyo, Saitamaseisakujo
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第五の共同発明者氏名	FULL NAME OF EIGHTH JOINT INVENTOR IF ANY
発明者の署名 日付	SIGNATURE
住所	CITIZENSHIP
国籍	RESIDENCE
郵便住所	POST OFFICE ADDRESS

（第六またはそれ以降の共同発明者に対しても同様な情報および署名を提供すること。）

SKO-104-A-1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Hideo Tojo et al.
Serial Number:	08/398,881
Filed:	March 6, 1995
Group Art Unit:	1112
Examiner:	J. Bell
Title:	Method and Machine for Forming Protective Film on Sprayed Coating of Large-Sized Product

VERIFIED STATEMENT

Box Patent Applications
Commissioner Of Patents And Trademarks
Washington, D.C. 20231

Sir:

In connection with the subject new divisional patent application (filed concurrently herewith), the undersigned attorney for applicant hereby states that the copy of the original signed prior application papers, including the specification, claims, abstract, Declaration and drawings which are being filed concurrently herewith comprise a true copy of the prior application, Serial Number 08/398,881as filed on March 6, 1995 in accordance with 37 CFR 1.60.

The undersigned attorney for applicant declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Respectfully submitted,

Joseph P. Carrier
Attorney for Applicant
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WEINER, CARRIER & BURT, P.C.
Maxim Building
42400 Grand River Avenue, Suite 207
Novi, Michigan 48375
April 3, 1996

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to Commissioner of Patents and Trademarks, Washington, D.C. 20231 on April 3, 1996.

Dated: April 3, 1996
JPC/jg
Enclosure

Jody Greene